

LISTING OF THE CURRENT CLAIMS
IN ACCORDANCE WITH REVISED AMENDMENT PRACTICE

Claims 1-23: Canceled.

24. (Original) A physical vapor deposition target comprising:
a shape, the shape including at least one cup having a first end and a second end in opposing relation to the first end; the first end having an opening extending therein; the cup having a hollow therein; the hollow extending from the opening in the first end toward the second end; the cup having an interior surface defining a periphery of the hollow; the shape including an exterior surface extending around an exterior of the cup and in opposing relation to the interior surface; the exterior surface comprising a region which wraps around at least a portion of the second end with a rounded corner; the rounded corner having a radius of curvature of at least about 1 inch; and
a sputtering surface defined along the interior surface of the cup.
25. (Original) The physical vapor deposition target of claim 24 wherein the interior surface does not comprise a rounded corner having a radius of curvature of at least about 1 inch.
26. (Original) The physical vapor deposition target of claim 24 wherein the interior surface comprises a rounded corner having a radius of curvature of at least about 1 inch.
27. (Original) The physical vapor deposition target of claim 24 wherein the interior surface comprises a rounded corner having a radius of curvature of at least about 1 inch; and wherein the rounded corner of the interior surface is within the rounded corner of the exterior surface.
28. (Original) The physical vapor deposition target of claim 24 consisting essentially of high purity copper.

29. (Original) The physical vapor deposition target of claim 24 consisting essentially of Ta.
30. (Original) The physical vapor deposition target of claim 24 consisting essentially of Ti.
31. (Original) The physical vapor deposition target of claim 24 comprising one or more of Cu, Ni, Co, Ta, Al, and Ti.
32. (Original) The physical vapor deposition target of claim 24 comprising copper together with one or more of Cd, Ca, Au, Ag, Be, Li, Mg, Al, Pd, Hg, Ni, In, Zn, B, Ga, Mn, Sn, Ge, W, Cr, O, Sb, Ir, P, As, Co, Te, Fe, S, Ti, Zr, So, and Hf.
33. (Original) The physical vapor deposition target of claim 24 consisting essentially of copper and at least one element selected from the group consisting of Cd, Ca, Au, Ag, Be, Li, Mg, Al, Pd, Hg, Ni, In, Zn, B, Ga, Mn, Sn, Ge, W, Cr, O, Sb, Ir, P, As, Co, Te, Fe, S, Ti, Zr, Sc, Sn and Hf; and wherein the copper is present to a concentration of less than or equal to about 99.99%, by weight.
34. (Original) The physical vapor deposition target of claim 33 wherein the at least one element is selected from the group consisting of Ag, Al, In, Zn, B, Ga, Mn, Sn, Ge, Ti and Zr.
35. (Original) The physical vapor deposition target of claim 33 wherein a total amount of the at least one element is from at least about 100 ppm to less than about 10%, by weight.
36. (Original) The physical vapor deposition target of claim 33 wherein a total amount of the at least one element is from at least 1000 ppm to less than about 2%, by weight.
37. (Original) The physical vapor deposition target of claim 24 consisting essentially of CuSn, with the Sn being present to from about 100 ppm, by weight, to about 3 atomic percent.

38. (Original) The physical vapor deposition target of claim 24 consisting essentially of CuAl, with the Al being present to from about 100 ppm, by weight, to about 3 atomic percent.
39. (Original) The physical vapor deposition target of claim 24 consisting essentially of CuAg, with the Ag being present to from about 100 ppm, by weight, to about 3 atomic percent.
40. (Original) The physical vapor deposition target of claim 24 wherein the exterior surface wraps entirely around the second end.
41. (Original) The physical vapor deposition target of claim 24 wherein the radius of curvature is at least about 1.5 inches.
42. (Original) The physical vapor deposition target of claim 24 wherein the radius of curvature is at least about 1.7 inches.
43. (Original) The physical vapor deposition target of claim 24 wherein the radius of curvature is at least about 1.8 inches.
44. (Original) The physical vapor deposition target of claim 24 wherein the shape consists essentially of a material having an average grain size of less than or equal to 250 microns.
45. (Original) The physical vapor deposition target of claim 24 wherein the shape consists essentially of a material having an average grain size of less than or equal to 200 microns.
46. (Original) The physical vapor deposition target of claim 24 wherein the shape consists essentially of a material having an average grain size of less than or equal to 100 microns.
47. (Original) The physical vapor deposition target of claim 24 wherein the shape consists of a material having an average grain size of less than or equal to 250 microns.

48. (Original) The physical vapor deposition target of claim 24 wherein the shape consists of a material having an average grain size of less than or equal to 200 microns.
49. (Original) The physical vapor deposition target of claim 24 wherein the shape consists of a material having an average grain size of less than or equal to 100 microns.
50. (Original) A magnetron plasma sputter reactor comprising:
a plasma chamber configured to accommodate a substrate to be sputter coated;
the physical vapor deposition target of claim 24 within the chamber; and
a configuration of magnetic materials proximate the target and configured to generate a magnetic field having magnetic field lines extending within the hollow of the target.
51. (Original) The magnetron plasma sputter reactor of claim 50 wherein the target interior surface does not comprise a rounded corner having a radius of curvature of at least about 1 inch.
52. (Original) The magnetron plasma sputter reactor of claim 50 wherein the target interior surface comprises a rounded corner having a radius of curvature of at least about 1 inch.
53. (Original) The magnetron plasma sputter reactor of claim 50 wherein the target interior surface comprises a rounded corner having a radius of curvature of at least about 1 inch; and wherein the rounded corner of the interior surface is within the rounded corner of the exterior surface.
54. (Original) The magnetron plasma sputter reactor of claim 50 wherein the target consists essentially of high purity copper.
55. (Original) The magnetron plasma sputter reactor of claim 50 wherein the target consists essentially of Ta.

56. (Original) The magnetron plasma sputter reactor of claim 50 wherein the target consists essentially of Ti.
57. (Original) The magnetron plasma sputter reactor of claim 50 wherein the target comprises one or more of Cu, Ni, Co, Ta, Al, and Ti.
58. (Original) The magnetron plasma sputter reactor of claim 50 wherein the target material consists essentially of CuSn, with the Sn being present to from about 100 ppm, by weight, to about 3 atomic percent.
59. (Original) The magnetron plasma sputter reactor of claim 50 wherein the target material consists essentially of CuAl, with the Al being present to from about 100 ppm, by weight, to about 3 atomic percent.
60. (Original) The magnetron plasma sputter reactor of claim 50 wherein the target material consists essentially of CuAg, with the Ag being present to from about 100 ppm, by weight, to about 3 atomic percent.
61. (Original) The magnetron plasma sputter reactor of claim 50 wherein the target exterior surface wraps entirely around the second end.
62. (Original) The magnetron plasma sputter reactor of claim 50 wherein the radius of curvature is at least about 1.5 inches.
63. (Original) The magnetron plasma sputter reactor of claim 50 wherein the radius of curvature is at least about 1.7 inches.
64. (Original) The magnetron plasma sputter reactor of claim 50 wherein the target shape consists essentially of a material having an average grain size of less than or equal to 250 microns.
65. (Original) The magnetron plasma sputter reactor of claim 50 wherein the target shape consists essentially of a material having an average grain size of less than or equal to 200 microns.

66. (Original) The magnetron plasma sputter reactor of claim 50 wherein the target shape consists essentially of a material having an average grain size of less than or equal to 100 microns.
67. (Original) A three-dimensional physical vapor deposition target, comprising:
a material comprising one or more of Cu, Ni, Co, Ta, Al, and Ti;
an average grain size of less than or equal to 250 microns within the material;
a shape, the shape including at least one cup having a first end and a second end in opposing relation to the first end; the first end having an opening extending therein; the cup having a hollow therein; the hollow extending from the opening in the first end toward the second end; the cup having an interior surface defining a periphery of the hollow; and
a sputtering surface defined along the interior surface of the cup.
68. (Original) The three-dimensional physical vapor deposition target of claim 67 wherein the material consists essentially of copper; and wherein the target consists essentially of the material.
69. (Original) The three-dimensional physical vapor deposition target of claim 67 wherein the material consists essentially of tantalum; and wherein the target consists essentially of the material.
70. (Original) The three-dimensional physical vapor deposition target of claim 67 wherein the material consists essentially of CuSn, with the Sn being present to from about 100 ppm, by weight, to about 3 atomic percent; and wherein the target consists essentially of the material.
71. (Original) The three-dimensional physical vapor deposition target of claim 67 wherein the material consists essentially of CuAl, with the Al being present to from about 100 ppm, by weight, to about 3 atomic percent; and wherein the target consists essentially of the material.

72. (Original) The three-dimensional physical vapor deposition target of claim 67 wherein the material consists essentially of CuAg, with the Ag being present to from about 100 ppm, by weight, to about 3 atomic percent; and wherein the target consists essentially of the material.
73. (Original) The three-dimensional physical vapor deposition target of claim 67 wherein the average grain size is less than or equal to 200 microns.
74. (Original) The three-dimensional physical vapor deposition target of claim 67 wherein the average grain size is less than or equal to 100 microns.
75. (Original) The three-dimensional physical vapor deposition target of claim 67 wherein the average grain size is less than or equal to 90 microns.
76. (Original) The three-dimensional vapor deposition target of claim 67 wherein the average grain size is less than or equal to 85 microns.
77. (Original) The three-dimensional physical vapor deposition target of claim 67 being in a shape of an Applied Materials Self Ionized Plasma PlusTM target.
78. (Original) The three-dimensional physical vapor deposition target of claim 67 being in a shape of a Novellus Hollow Cathode MagnetronTM target.
79. (Original) A magnetron plasma sputter reactor comprising:
a plasma chamber configured to accommodate a substrate to be sputter coated;
the three-dimensional physical- vapor deposition target of claim 67 within the chamber; and
a configuration of magnetic materials proximate the target and configured to generate a magnetic field having magnetic field lines extending within the hollow of the target.
80. (Original) The magnetron plasma sputter reactor of claim 79 wherein the target material consists essentially of copper.

81. (Original) The magnetron plasma sputter reactor of claim 79 wherein the target material consists essentially of tantalum.
82. (Original) The magnetron plasma sputter reactor of claim 79 wherein the target material consists essentially of CuSn, with the Sn being present to from about 100 ppm, by weight, to about 3 atomic percent.
83. (Original) The magnetron plasma sputter reactor of claim 79 wherein the target material consists essentially of CuAl, with the Al being present to from about 100 ppm, by weight, to about 3 atomic percent.
84. (Original) The magnetron plasma sputter reactor of claim 79 wherein the target material consists essentially of CuAg, with the Ag being present to from about 100 ppm, by weight, to about 3 atomic percent.
85. (Original) The magnetron plasma sputter reactor of claim 79 wherein the target material average grain size is less than or equal to 200 microns.
86. (Original) The magnetron plasma sputter reactor of claim 79 wherein the target material average grain size is less than or equal to 100 microns.
87. (Original) The magnetron plasma sputter reactor of claim 79 wherein the target material average grain size is less than or equal to 90 microns.
88. (Original) The magnetron plasma sputter reactor of claim 79 wherein the target material average grain size is less than or equal to 85 microns.
89. (Original) The magnetron plasma sputter reactor of claim 79 wherein the target shape is that of an Applied Materials Self Ionized Plasma PlusTM target.